

Design and Implementation of an Intelligent Web-Based Academic Advising System for Caritas University

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Abstract- *Academic advising plays a crucial role in guiding students toward timely graduation and academic success. However, traditional advising methods are often time-consuming, inconsistent, and limited by advisor availability. This study presents the design and implementation of an intelligent web-based academic advising system for Caritas University. The system integrates rule-based intelligence to provide personalized course recommendations, prerequisite checking, degree progress monitoring, and automated responses to students' queries. The platform was developed using PHP, MySQL, JavaScript, HTML, CSS, and Bootstrap. The system was evaluated through functional testing and user feedback from students and academic advisers. Results indicate that the system improves advising efficiency, accessibility, and decision-making for both students and advisers.*

Keywords: *Intelligent Academic Advising, Artificial Intelligence, Web-Based System, Academic Recommendation System, Decision Support System, Higher Education.*

I. INTRODUCTION

1.1 Background of the Study

Academic advising or counseling is said to be key to student success and academic achievements. The present academic advising method vary considerably and little is known about its productivity and effectiveness. These days, with the increase in poor academic performance by students in the current educational environment, strong academic advising system is an essential ingredient to improve students' academic success, support the present advice system aimed at productive and efficient learning. Academic advising is an important key and activity of an academic institution. It provides guidelines and counsel to students to explore future career paths, academic disciplines and other challenges accompanied with peer pressure. An automated, accurate and full functional advising system can be

an effective tool for both students and academic advisers. The complex nature of academic syllabus, especially with recent changes in academic to general education and other degree requirements, this challenge poses a continuous challenge to faculty advisers to remain up-to-date. Academic counseling plays a vital role in creating an enabling educational environment for academic institution students. Furthermore, faculty advisers find it difficult because the process is time consuming for academic advisers especially with the dynamic nature of combining other school activities with counseling. Despite these challenges, academic counselors always try their very best to offer accurate, up-to-date and consistent advising information to their students.

Therefore, with the advancement in technology, there is a need to improve the educational counseling system; surely there is a need to advance even faster than the manual procedure since it affects a large percentage of students from different academic disciplines. With the computerized system, they would be a great improvement in student academic performance, as the system will act as a bridge to help bring better information to students and improve academic skill.

1.2 Statement of the Problem

The Current method of giving counsel to students entails a lot of paper work and documentation, which sometimes leads to loss or damage. This traditional method depends greatly on the effort of the advisers to find the best counsel and suggestions to improve students' academic performance. In institutions with large number of students, academic advising is timeconsuming and the only means to improve the way counsel is given to students is to implement an automated system that will make the process successful and efficient.

There is a need for a computerized and intelligent system that can give advice and offers immediate counseling to a large number of students at the same time, anytime any day. Moreover, in the present system of academic adviser-and-student face to face interaction as it's done at Caritas University, some students may find it difficult to meet the adviser due to fear, character or unavailability of that academic adviser. In the research, we outline a smart system; the system will assist students in improving their academic performance by giving academic advice relating to courses, students' personal issues that meet their current needs and overall improves their academic performance.

1.3 Aim and Objectives of the Study

The aim of the study is to design and implement an intelligent system that will offer Student Academic Advice, with the following objectives:

- Design of a friendly interactive user interface that is easy to use
- Creation of a system database to store all the necessary information
- To implement an intelligent recommendation module that assists students in selecting appropriate courses based on academic records and programme requirements
- Provision for students' complaints submission and retrieval
- Protection of submitted entries from unauthorized personnel
- Establishment of a secured system against information theft or loss

1.4 Scope of the Study

The scope of the research is focused on designing an intelligent, automated and secured student academic advising system for Caritas University, and when fully implemented, the system will solve the challenges that students face in the traditional academic advising system.

II. LITERATURE REVIEW

2.1 Introduction

The introduction of computer into information technology has massively improved the information need of organization; the success of this machine is

dependent on the knowledge base. To streamline the activities of academic advisers, Hemwall and Trachte (2005) proposed ten vital principles academic advisers should adhere to. They include consideration of university mission and vision; encouragement of critical thinking in students; alignment of advisee personal goals with institutional goals; awareness of advisee's strengths and weaknesses, dissecting advisee mindset and sensitizing them as well as understanding advisees' individual backgrounds. Others are creating conducive atmosphere for academic excellence; leading the dialogue between adviser and advisee as an advanced learner with more useful information; guiding advisees in ways that make the students think critically about their role in college as well as to face contradictions and difficult issues as they arise. Lowenstein (2005) also outlined basic functions of academic advisers cutting across their academic, personal/social and career aspects as well as full integration into the university culture.

Emphasis on academic advising stems from its obvious importance in actualizing individual and institutional goals. Quality advising fosters student development and at the same time enriches the academic community, the adviser, and the society at large. It contributes to students' perceptions of the University as they teach their students the cultural robes of their institutions. Good academic advising generally has a positive impact on students' academic performance as well as personal satisfaction with their college experience. Universities should leverage on academic advising to enhance learning outcomes and other benefits. Simpson (2013) identifies the benefits of effective academic advising as creating relationships between gown and town (college and real world), increasing retention, fostering alumni relationships, fostering development of life-long learning and decision-making abilities as well as adjustment to college life. Drake (2011) highlights that academic advising assists student to understand their strengths and weaknesses. Oriano (2013) concludes that recurrent and meaningful academic advising increases student's engagement and learning outcomes. Smith (2005) identifies proper academic advising as increasing overall satisfaction with college, promoting effective use of campus support services and encouraging contact with staff outside

the classroom. Good academic advising might be the single most under-estimated factor of a successful college experience (Light, 2001).

2.2 Meaning of Academic Advising System

Academic advising is the process between the student and an academic advisor of exploring the value of a general education, reviewing the services and policies of the institution, discussing educational and career plans, and making appropriate course selections.

Academic advising is a specialized aspect of teaching involving students and teachers. It is a process which provides institutions with the opportunity to personalize education and to engage students in their own learning. It is an extension of faculty and research. According to Frost (2000) academic advising originated from a general university teaching practice in US at about 1870, where teachers intuitively advised students about their general academic progress and vocational operations. That is, advising was based on supplying students' answers to questions about scheduling and registering for classes. Frost linked the rationale for academic advising to three philosophies developed in the U.S. universities; the notions of utility, liberal culture and research.

Tertiary institutions however have failed to perform optimally in varying respects. Students complete their programmes without actually becoming knowledgeable in the courses undertaken. The quality of the turnout appears suspect as a very high percentage of graduates have been found to be unable to meet the manpower requirements of vital sector of the economy (FME, 2000). Yet the demand for access to higher education continues unaffected due to its social benefits, especially in a society in which social mobility depends largely on the level of education acquired. The high rate of unemployed graduates, particularly in their specific fields of training, remains a problem but it has not served as a deterrent to those seeking admission into tertiary institutions. It has been observed that tertiary institutions in Nigeria are in a state of decay (FME, 2000). Government is aware that the situation portends danger to the country particularly as poor quality graduates who may not be able to effectively

hold executive positions in the public service in the future are currently being produced. Although there are several other factors responsible for quality decline in our tertiary institutions, there is need to focus on quality promoting activities. The challenge now is to evolve and create a system of academic advising that is in line with the objectives of tertiary institutions to provide effective academic learning and develop performance skills in students, especially for those who encounter academic difficulties (Henning, 2007).

Academic advising involves far more than helping students select their courses. It includes helping students adjust to college, succeed in college and prepare for life after school. Academic advisor is the school first line contact with students. Ludeman (2001), explains that academic is academic advising provides students with accurate information about academic progression and grade requirement. It helps students to access resources in the school that will enhance their ability to be academically successful as well as review, use available data about students' academic and educational needs, performance, aspirations and problems. He identified typical academic advising activities to include: assisting students with decision- making and career direction, assisting students in the selection of courses and other educational experiences; helping students understand and comply with institutional policies, procedures and programmes; evaluating student progress toward established goals; collecting and distributing data regarding student needs, preferences, and performance for use in refining or revising institutional/agency decisions, policies, and procedures; interpreting various interest/ability inventories that provide students with information related to their career choices; and utilizing a variety of supplemental systems such as on-line computer programmes to deliver advising information.

Retention in higher education refers to the ability of an institution to keep students enrolled. Students enter institutions with varying backgrounds and experiences, which contribute to their intentions, goals and commitments to the institution. Once students matriculate, experiences with the teachers,

students and staff occur within the academic and social systems of the institution. If the experiences are positive, then the student goals and institutional commitment are strengthened. If the experiences are negative, then the student is not properly integrated into the institutional setting, the student is more likely to withdraw (Tinto, 1987, King, 1992).

To manage students' retention, the institutions need to evolve a mechanism that maximizes student/teacher contact. Such contacts could serve as incentives to increase enrolment and will lead to greater integration and retention. Academic advising from the perspective of student retention, help institutions to personalize education and to engage students in their own learning. Advisors help students to become integrated into the academic and social fabric of the institution. The best way to keep students enrolled is to keep them stimulated, challenged, and progressing toward a meaningful goal. One way to do that especially with new students is through meaningful academic advising.

2.3 Why Academic Advising?

According to the Global Community for Academic Advising, National Academic Advising Association (NACADA), the academic advising aims to: educate students about the objectives and the meaning of the institution; inform students about the courses requirements; assist students to understand the courses and programs purposes and enhance students' personal development to achieve academic and career success. Overall, all universities around the world work on improving academic advising because it is important and has a key role in students' success, satisfaction, and graduation rate. The advisor guides the student about the academic, personal, and social issues (David et al, 1997). In general, academic advising includes the following task (Virginia et al, 2011): Explanation of major, career and life goals; □ Selection of suitable courses and educational plans.

- Clarification of institution requirements.
- Enhancement of the student awareness about learning assistance programs and resources.
- Evaluation of the student performance and goals and reinforcement of student selfdirection.

- Advisors often serve as intermediaries between students and instructors in large lecture courses where the enrolled students are counted in hundreds.

Academic advising aims to enhance students' success, raise retention and satisfaction, minimize majors changing, increase the graduation rate, and educate the students about their academic, personal and career goals.

2.4 The Traditional Style of Academic Advising

The academic advising tasks were usually performed in a traditional way using a paper-based form. In the traditional way of advising, both the advisor and advisee sit in a place, where the advisor takes a copy of the student's academic record and requirements, discusses with the student for a better understanding and hence gives him some face-to-face advice or suggestions. This style of advising has been encountering great difficulty that may disturb the academic advising success and efficiency (Nwelih, 2013). In a large university for example and with a huge number of students, communication with each student is an impossible task. Also, the process in the traditional way may be inaccurate where the available information is not always enough, or the advisor experience may not be enough.

- Traditional advising is a time-consuming task that needs a great effort to guide students successfully and efficiently.
- It depends significantly on the advisor's effort and due to the limited time and experience, there is a high possibility of making mistakes. It is important that advisors have good knowledge about academic requirements, educational plans, and rules.
- In some cases, programs are under review and advisors are sometimes not up to date.
- Such deficiency can result in inaccurate advice (Nwelih, 2013).
- The advising sessions are limited in time, notably during the highest-demand periods.
- The advising quality is affected by the meeting time length. Advisors usually spend less time with students if they have a high number of students or dash the advising process to minimize the load of the advising meeting. Usually, this happens in the

registration periods where many students need to meet the advisor (Henderson, 2015).

- The student in the traditional academic advising method spends a long waiting time to meet the advisor and the student available time may clash with the advisor lectures time.
- Incorrect representation of information may cause mistakes in the advising. Advisors need to use multiple files and documents at a time, which makes the advising process boring while they are switching between multiple sources (Al-Nory, 2012).

2.5 Technology in Academic Advising

Technological transformation partly changes the way of student advising delivery. Electronic resources are available and easily accessible in most universities which are one way of 'nontraditional' advising. Technology utilization changes the traditional advising services from direct human interaction to the automated online advising style (Henderson, 2015). In fact, the academic institution uses technology in academic advising to reduce costs, produce more flexibility, accountability, facility, and better streamlined services, which in return increase the graduation rate and the student satisfaction level. Technology contributes in making informed decisions and in providing better services. Despite offering an alternative for the students who are unable to meet the advisor physically, advisors should consider technology as a helping tool to ease the advising process, enhance the advising experience and alleviate workload but they should not regard it as a substitute to human advice (Daramola, et al 2014). The integration of human and technology will help save time for advisors, enhance the student's experience, satisfaction and facilitate graduation on time (Gaines, 2014).

2.6 Approaches to advising students

There are two approaches to advising students: one is called prescriptive, where the advisor tells the student what needs to be done in order to graduate; and the other is called developmental, where the advisor and student collaborate together to ensure that the student graduates on time. A prescriptive advisor does not allow the student to make their own choices in the direction of their education, but rather is told what

they should do according to their advisor. The relationship between a student and advisor who uses prescriptive advising is very "impersonal and authority-based, answering only specific questions and not taking individual development into consideration" (Jordan, 2000; as cited in Hale, Graham, & Johnson, 2009, Developmental vs. Prescriptive Advising, para. 3). On the other hand, a developmental advisor allows the student to make all choices in their education, resulting in the student feeling as if they have chosen their own path rather than being told what they should do. "A developer extends the kinds of support provided through a mentoring relationship; however, in addition to career and psycho-social support, a developer engages in knowledge development, information sharing and support as students set and achieve goals" (Baker and Griffin, 2010, p. 5).

Allowing the student to choose their own direction will leave them feeling more satisfied with the career path they desire and take an interest in their own education.

Developmental advising "stimulates and supports students in their quest for an enriched quality of life" and it focuses on identifying and accomplishing life goals" (Hale et al., 2009, Developmental vs. Prescriptive Advising, para. 1). In a study conducted at a mid-South university, 429 students were surveyed to determine the style of advising used by their current advisor and also the advising style that the student preferred. Results indicated that nearly all (95.5%) students preferred the developmental advising style and 78% out of all students were actually receiving developmental advising (Hale et al., 2009, para. 1). Although faculty advising is one key to student success, the type of advising is crucial to student development. Every student is different, but past research has shown that most students prefer developmental advising rather than prescriptive advising because it not only allows them to make their own decisions in their education, but it also allows them to create a professional relationship with their advisor in order to seek guidance and support.

2.7 National History on Advising Systems

Student advising has historically taken many different forms all with the goal of assisting the

student as they work toward their goal of completing their degree. Below are a few examples that illustrate the evolution of student advising at selected institutions and how these institutions incorporated computer systems using different methods.

At the University of Maryland in 1987, “a small group embarked on an experiment to enhance student advising using student data downloaded from the administrative mainframe to PCs”, (Areu, Klavon, Munn, 1989, p. 24). This system and method of advising grew in popularity since it offered advisors the ability to view records, make electronic notes, and search for students with similar characteristics, mail merge functionality, report writing, academic audits, statistical analysis and management tools (Areu et al., 1989, p. 30). The academic audit did “aid the advisor in examining the advisee’s academic record” (Areu et al., 1989, p.30). The system programmed academic requirements and matched them against a student’s record. This made the advising sessions much more productive since the advisor could focus on other advising aspects, such as professional development and career planning. One limitation and future improvement of this system was that the information was only available to the advisor and not to the student.

Many early advising systems were a series of people, from peer advisors, to professional advisors and to faculty advisors. According to David Crockett, “the bottom line of effective advising is improved educational/career planning, academic success, student growth and development, and lower dropout rates” (Crockett, 1982, p.1). Crockett’s system consisted of a form that students filled out and then turned in to an advisor. The advisor then analyzed the form and developed an action plan for the student.

In 1992, the University of Wisconsin-LaCrosse developed a system that allowed students to enter their courses taken and grades into a computer. The student then saved the information on a diskette and took it to an advisor. The advisor read the information on the diskette and assisted the student in matching the courses with a degree program and further requirements.

This was referred to as computer-assisted advising. A term coined by Gary Kramer (Kramer, et al, 1994). William Wehrs stated, “advising systems were well-suited for academic advisement using an expert system application for two reasons. First, it is naturally a consultation process between student and advisor. Second, the majority of the expertise can be codified as curriculum requirements” (Wehrs, 1992, p. 1).

In 1992, a grant awarded to Portland Community College allowed the college to develop a system to combine information across student services units. The development team created a student tracking system using a computerized method. Professional advisors were trained on the computer system, how to use it to advise students, and create documentation regarding the advising conversation. The purpose of the grant was to provide better quality advising, with the hope that this would lead to a greater number of students completing their degrees (Bach, 1992, p. 4). This system was a mainframe system that allowed advisors to see limited access regarding advisees and it was not accessible to students.

In 1994, Brigham Young University was using the “Advisement by Computer” method.

Advisors had access to curriculum degree requirements and students’ academic records. When a report was run for a student, “a program would match the student’s record to degree requirements and display the results” (Kramer, 1994, p. 151). The advisors printed out these reports during each advising session. Advising offices also delivered the reports to students at the beginning of each semester when they met with their advisor for course registration and planning.

Although they were printed out and the student did not have direct access to the information, “the reports did provide detailed information on major requirements, substitutions, waivers and transfer work, repeated coursework, identified which courses would meet graduation requirements, and determined acceptable versus unacceptable grades” (Kramer, 1994, p. 152). In 1996, Pennsylvania State University developed their version of an advising system. This limited system allowed for students to calculate

Grade Point Averages (GPAs). In addition, it allowed students to “calculate semester and cumulative grade-point averages based on a student’s predicted grades for the current enrollment period (Leonard, 1996, p.47).

In most cases, those close to the advising experience created advising systems for graduate and undergraduate students. The efforts enhanced the student and advisor experience. The systems helped advisors spend less time looking at and analyzing data. This, in turn, allowed more time to provide advice on career paths or university policies and procedures.

III. SYSTEM ANALYSIS AND METHODOLOGY

3.1 Data Gathering

Data Gathering is an important aspect of system analysis, and this will help to understand the operations of the existing system and also to design the proposed system. Therefore, in gathering data, the researcher made use of observation method as he a part of the system, as well as documentations on the Internet as he went online to surf out materials for the study.

3.2 System Analysis

Here both the existing system as well as the proposed system will be analyzed as follows;

3.2.1 Analysis of the Existing System

The existing system of advising students is a traditional way using a paper-based form. In this traditional way of advising, both the advisor and advisee sit in a place, where the advisor takes a copy of the student’s academic record and requirements, discusses with the student for a better understanding and hence gives him some face-to-face advice or suggestions. This style of advising has been encountering great difficulty that may disturb the academic advising success and efficiency (Nwelih, 2013). In a large university for example and with a huge number of students, communication with each student is an impossible task. Also, the process in the traditional way may be inaccurate where the available information is not always enough, or the advisor

experience may not be enough. After analyzing the existing system, the following flaws were discovered:

- Traditional advising is a time-consuming task that needs a great effort to guide students successfully and efficiently.
- It depends significantly on the advisor’s effort and due to the limited time and experience, there is a high possibility of making mistakes. It is important that advisors have good knowledge about academic requirements, educational plans, and rules.
- In some cases, programs are under review and advisors are sometimes not up to date.
- Such deficiency can result in inaccurate advice (Nwelih, 2013).
- The advising sessions are limited in time, notably during the highest-demand periods.
- The advising quality is affected by the meeting time length. Advisors usually spend less time with students if they have a high number of students or dash the advising process to minimize the load of the advising meeting. Usually, this happens in the registration periods where many students need to meet the advisor (Henderson, 2015).
- The student in the traditional academic advising method spends a long waiting time to meet the advisor and the student available time may clash with the advisor lectures time.
- Incorrect representation of information may cause mistakes in the advising. Advisors need to use multiple files and documents at a time, which makes the advising process boring while they are switching between multiple sources (Al-Nory, 2012).

3.2.2 Analysis of the Proposed System

The proposed system is web-based. It is computerized and online in nature. It runs 24/7, even during non-school hours. It is easily accessible and available unlike the existing system that can only function when the academic adviser/advisor and the advisee are both present. The proposed system is fast and reliable. The proposed system makes provision for all the courses offered in each faculty of the University. It contains departmental handbook associated with each department for easy access of the student. This handbook gives details of courses

offered in each department in each semester with their respective credit units. It further explains to students how to compute their Cumulative Grade Point Average (CGPA). The Proposed system gives details of students' results, makes provision for Frequently Asked Questions (FAQs)/Answers as well as making room for students their views and receiving feedbacks.

In fact, the proposed system is really friendly, easy to use and tailored to meet students' academic needs.

3.2.3 Functional Requirements

Examples:

- Student registration and login
- Advisor login
- Course management
- Appointment scheduling
- Academic record management
- AI recommendation generation
- Chat assistant (if implemented)
- Report generation

3.2.4 Database Design

Tables such as:

- Student
- Advisor
- Course
- Department
- Programme
- Registration
- Recommendation
- Advising Session
- User
- Role

3.2.4. Justification of Proposed System

The Proposed system is web-enabled, which makes it easier for users to access the application from anywhere via the Internet, and be able to carry out

their work, and students with authorization would be able to view their academic records online. The proposed system is faster, more reliable and accessible to the users than the existing system as it is available on the Internet twenty-four hours a day and seven days a week. The proposed system gives more accurate and updated information to the students than the existing system.

3.3 Choice of Methodology

In order to actualize the set goals of this study, Structured System Analysis and Design Methodology (SSADM) was adopted. System Analysis and Design Methodology (SSADM) is a set of standards for systems analysis and application design. It uses a formal methodical approach to the analysis and design of information systems. Systems analysis is defined as the study of an existing system, the purpose of which is to determine if there are any problems or shortcomings of the system. This methodology is so chosen because it divides the project into small modules with well-defined objectives. With this, adequate information was gathered through personal observation and interview about operations of the existing system.

IV. SYSTEM DESIGN AND IMPLEMENTATION

4.1 System Specification and Design

In this subheading, we shall consider different specifications and designs of the system such as input, output, security, database, etc.

4.1.1 Input design and specification

Inputs to the system shall be the name of the user or administrator and the corresponding password. Fig. 4.1 below is Input design which specifies the inputs to the system as user' e-mail address and password;



Fig.4.1: Input design

4.1.2 Output design and specification

The outputs to the system will be a message or a dialogue box with options confirming a successful input. The output design is shown in fig. 4.2 below;



Fig. 4.2(a): Output design



Fig. 4.2 (b): Output screen

4.1.3 Security design and specification

There is a high restriction of access to unauthorized persons. In this case it is the administrator who works with the Management that will have access to the system. The security design is as follows;

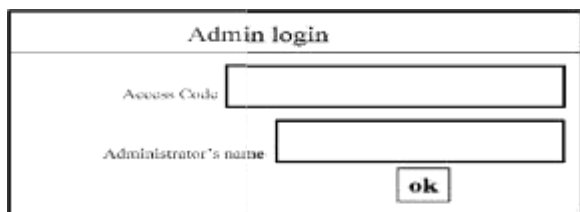


Fig. 4.3: Security design

4.2 System Development tools and justification

This section presents the software development tools and technologies employed in the design and implementation of the proposed intelligent web-based academic advising system. The selected technology were chosen based on their efficiency, compatibility, ease of use and suitability for developing dynamic web applications

- i. CSS (Cascading Style Sheet): It provides a way to style and present HTML. It provides a well formed, attractive, fine and simple style that enables the system become more presentable. Twitter Bootstrap is also used to improve the appearance of the interfaces of the application program.
- ii. HTML (Hyper Text Markup Language): Hyper Text Markup Language is a markup language that web browsers use to interpret and compose text, images and other material into visual or audible web pages. Default characteristics for every item of HTML markup are defined in the browser, and these characteristics can be altered or enhanced by the web page designer's additional use of CSS.
- iii. JavaScript and jQuery: JavaScript allow client-side scripts to interact with the user, control the browser, communicate asynchronously, and alter the document content that is displayed. The most used JS library, jQuery is constructed to ease developers when creating scripts for a web page. Some features are selection and

manipulation of elements, CSS manipulation and HTML event functions.

iv. PHP (Hypertext Preprocessor)

PHP servers as the server-side scripting language responsible for implementing the application's business logic. It processes user requests, manages authentication, communicates with the database and performs creates, , reads, updates and delete(CRUD) operations. PHP also facilitates the implementation of the intelligent advising module by processing recommendation rules and generating personalized academic guidance based on students' academic records

v. MySQL: MySQL is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL). SQL is the most popular language for adding, accessing and managing content in a database. It is most noted for its quick processing, proven reliability, ease and flexibility of use.

4.3 System Requirements

We shall consider system requirements under hardware and software requirements as follows;

As the system is web-based, it should be Internet connected. We look at the system from the hardware, and software application used for effective implementation of the new design.

4.3.1 Hardware Requirements: For effective use of the new system, the minimum requirements for the hardware components are:

- Processor speed: 1.0 GHZ
- RAM: 256MB
- Hard Disk Drive: 40GB
- Display Unit: 14" Monitor (VGA)
- CD ROM drive: X54 or Flashdrive
- Keyboard: Windows enhanced
- Mouse: Optical
- Modem

4.3.2 Software Requirements

The least operating system that must be used is Windows7 Professional, although Windows 10 is preferable. Web browser like any of these; Chrome,

Mozilla Firefox, Internet Explorer, Opera Mini, etc should also be in the system.

4.4 System Flowchart

The system flowchart below shows how data flows within the system and decisions are made in order to control events. Fig. 4.4 illustrates the flowchart;

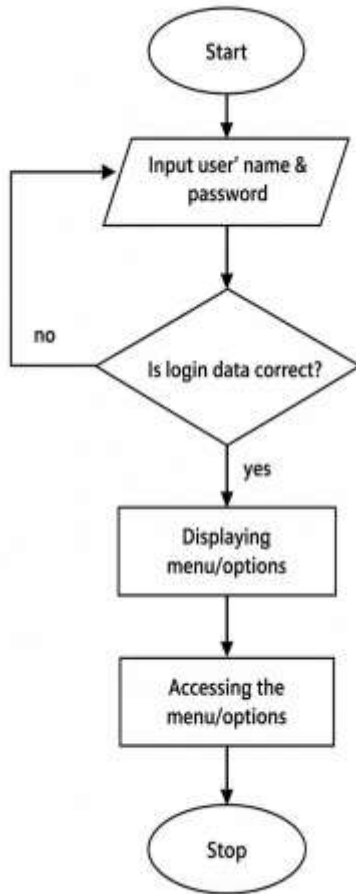


Fig. 4.4: System Flowchart

4.5 System Maintenance

In order to make sure that the new system functions properly, system maintenance must be duly observed.

The following must be considered in the maintenance activities;

- (i) Ensure that an appropriate windows firewall is configured to prevent “damaging programs” from the system.
- (ii) Ensure that an anti-virus program is installed, and the system is scanned when necessary.

- (iii) Delete unnecessary files from time to time to ensure disk space
- (iv) Ensure enough backup files and keep them away from magnetic area and dusty environment.

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

A student Academic advising system is aside from being feasible, more advantageous than the traditional method of storing records. Because it can be run on the university’s intranet, one does not have to be at the storage servers to access stored records. The developed Student Academic advising system supports multi-user access, securely stores records, and performs automatic computations, thus addressing several issues encountered in using the traditional filing system: security issues, slow record retrieval, manual computation, etc. among others. The aforementioned features of the system make it robust, flexible and can be integrated with another Database Management System, if the need arises. Various software development methodologies were also reviewed, and the desired one implemented.

5.2 Conclusion

From this research proposal, the introduction of Information Technology has made basic educational activities easier, faster and more secure. A Student Academic advising system, as opposed to the traditional method of storing records, will facilitate ease and orderliness in the university system.

Students will be more wont to carry out the course registration process because it’ll be made easier by the developed Student Academic advising system. Results will not be made available for public consumption, but rather seen only by the particular student to whom it belongs to; this also applies to information intended only for authorized access, thus implementing confidentiality, availability and data integrity on records.

5.3 Recommendations

Based on findings of the study, the following recommendations are suggested for consideration:

The university should replace the traditional filing system with the developed computerized Student Academic advising system.

The university should set up a wider range intra-network than the one in place now, one accessible from anywhere within the campus with which the System can be accessed. Wi-Fi repeaters, in conjunction with the installed network routers and switches, may be used to enable this function.

A unique team of staff with the necessary skill-set should be employed by the university to manage the Student Academic advising system, among which is the system administrator.

since the student academic advising system is built on the windows® desktop platform, the elibrary at the school and the computer systems in it should be made available for students without their own Pcs to access the system.

24/7 power should be made available to power up the servers, as well as the network devices in use. This can be implemented with the provision of a backup generator that starts up in the event of a power failure. The student academic advising system should be studied more to improve it, maintain and debug the system in the event of issues coming up.

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